Growing the Rural Economy with Renewable Energy

Windfarming and Bioenergy – New Crops for Missouri Farms

Holiday Inn Select – Columbia Missouri

March 6, 2003

David Osterberg

Environmental Health Sciences Research Center – University of Iowa

Iowa Policy Project – Mt. Vernon Iowa

Recent Article on Europe

- New York Times
- October 16, 2002
-

  Europe Pushes for Renewable Energy
  By PAUL MELLER

  RUSSELS, Oct. 15 - Romano Prodi has seen the hydrogen-powered light.

  In an interview today, Mr. Prodi, the president of the European Commission, described his view of Europe in a post-fossil-fuel era, when homes would generate the power they need from renewable sources like the wind and the sun, store it in hydrogen fuel cells and harness it as needed, replacing all the polluting energy sources in use today.

  He is not just musing. Speaking for the 15-nation European Union at a conference in Johannesburg over the summer, he said

- the union had set a goal of obtaining 22 percent of its electricity and 12 percent of all energy from renewable sources by 2010.

  Economics and geopolitics are behind the move as much as environmental concerns. Europe depends much more heavily on imported energy than the United States does: around 70 percent of its oil and gas comes from abroad, mainly the Middle East and Russia.

Statewide Economic Values of Alternative Energy Sources and Energy Conservation

David Swenson
Liesl Eathington
March 2002

The Iowa Policy Project
www.iowapolicyproject.org

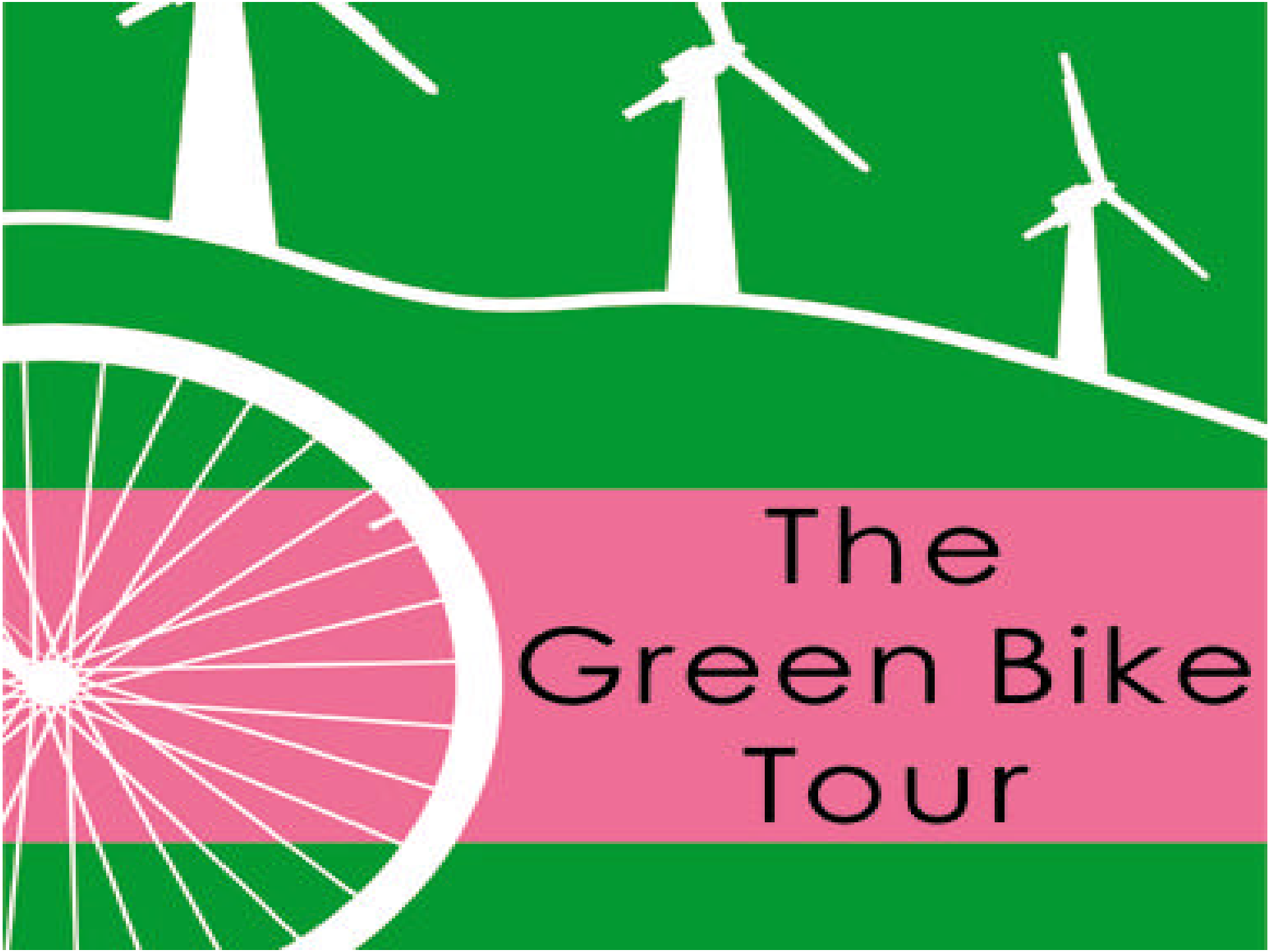
Why A Bike Tour?

- Show Global Warming Is Real
- Learn what is working in Northern Europe
- Bring attention to IPP report
- Create public interest in renewable energy
- Inform public policy work in Iowa

Why A Solar Bike?

Interesting News Angle

- DM Register, CR Gazette, Press Citizen, Iowa Farmer Today, Quad Cities Times, Waterloo Courier, Storm Lake Pilot, many weekly newspapers
- KUNI, WHO, Iowa Radio Network
- TV at school and church visits
- Good Website


The
Green Bike
Tour

Our Tour Schedule

- June 16 – July 8, 2002
- 23 days – 17 meetings

- The Netherlands
- Northern Germany
- Denmark

Who Paid for the Trips?

- Joyce Foundation
- Iowa Policy Project
- Leighty Foundation
- Olberg Family Charitable Trust
- Trees Forever
- Environmental Advocates
- Cedar Rapids Audubon Council
- 17 individuals
- The bike riders

Solar Bob in Transit

Four Renewable Power Efficiency Examples

- Methane
- Wind power
- Biomass
- Sustainable Cities

Methane Generation

Methane in Denmark

Aalborg Methane digester

- Industrial waste
- Agricultural waste
- Household waste

Technology Breakthroughs

- Export to Spain
- Developing World

Aalborg Methane Plant

Aalborg Methane Plant

Apeldoorn Methane Recovery

Methane in Iowa

- Landfill methane recovery
- Top Deck Dairy, West Bend

Top Deck Dairy near Westgate

Roger Decker of Top Deck Dairy & Alliant V.P Dan Mineck

Wind Power

Wind Power in Schleswig-Holstein

- Population 2.7 million
- Agricultural state
- 18 % electricity from wind
- 50 percent by 2010
- Incentives for small scale development

Wind in Germany

- 35,000 jobs in wind industry
- Wind turbines – significant user of steel
- Confronting Global Warming is economic development
- Technological Advantage

Wind in Iowa

- Currently at 2 + percent
- No Goals to Do More
- State Legislature Forced Iowa Utilities to Act
- Exporting Energy Dollars
- We Can Do BETTER!

Top of Iowa Wind Farm - Joice

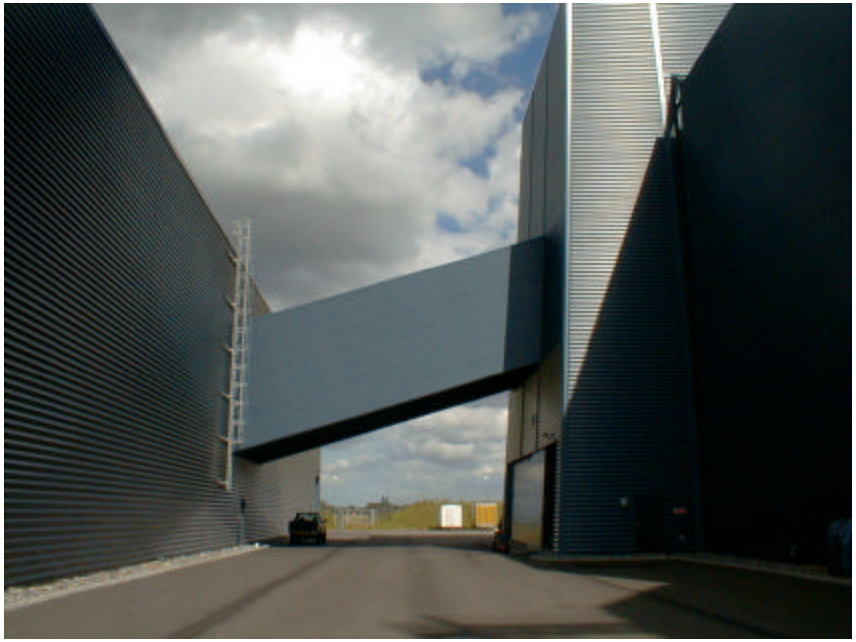
Burning Biomass

Biomass in Denmark

- Renewables currently at 10 percent of total energy use

- Sakskobing-Maribo
  - Burning straw
  - Producing electricity
  - Heating 12,500 homes

Saskobing Biomass Plant

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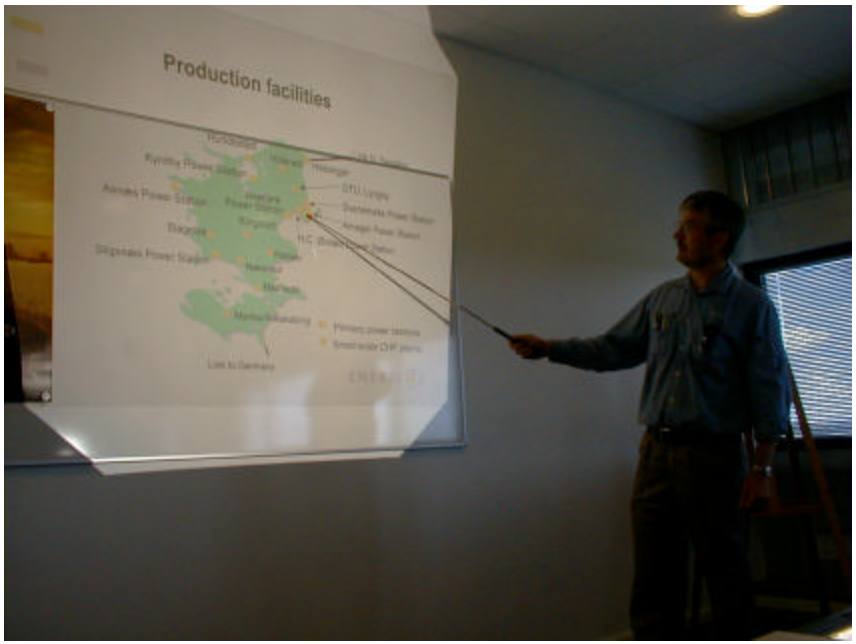
Straw Storage at Saskobing

Powerhouse at Saskobing Plant



TV in Des Moines

Randi Peterson’s Class

Iowa Examples

Power Plants Burning Biomass

- University of Iowa steam heating on campus
- Alliant 6th Street Power plant uses Quaker Oats oat hulls to produce Electricity and steam heating for downtown Cedar Rapids

Biomass Energy

Native crops, such as switch grass, can be harvested for energy, creating both farm income and wildlife habitat

Biomass in Iowa

- Ottumwa Generating Station
  Switchgrass test burn
- Sixth Street Station, Cedar Rapids
  Oat hulls
- University of Iowa Heating Plant
  Oat hulls
- BECON Facility, Nevada
  research and development

BECON in Nevada, Iowa

District Heating

District Heating

- Typical coal fired plant in Iowa converts only about 33 percent of it’s fuel into electricity. The rest of the potential energy becomes waste heat.

Not in Denmark

- The heat produced at the district heating-electric plant at Sakskobing, supplies heating for 12,500 residential and business customers.
- Produces “green” electricity

Benefits of Biomass and District Heating

- Reduced greenhouse gas emissions
- Far more efficient use of resources
- Can create second crop income for farmers

District Heating and Biomass in Cedar Rapids & Iowa City

Renewable & Sustainable

Clean Energy Development in the 2002 Farm Bill

- Energy Title IX: $400+ million over 5 years
  - half for direct financial assistance to farmers, ranchers, and rural small businesses for renewable energy system purchases and energy efficiency investments
  - half for Commodity Credit Corporation Bioenergy Program
- Conservation Title II: Windpower and Biomass Energy Development on CRP lands
- Rural Development Title VI: Renewable Energy Development Eligible for Grant and Loan Programs
- Research Title VII: Energy Efficiency Supported

Sustainable Cities

- Apeldoorn, Netherlands
- Hamm, Germany
- Aalborg, Denmark


Solarstrom
181
72858
OBI HAMM

Roof of the OBI store in Hamm

School in Hamm, Germany

Global Climate Change

Science is more sure each year

Rio Conference 1992
IPCC Report 1995
UNFCCC COP process (Kyoto treaty)
AGU recognition 1999
US National Academy of Science 2000 and 2001
IPCC Report 2001
US EPA 2002

Public Policy is not consistent

Bush Administration unsympathetic (2002)
California recognizes the issue (2002)
- Automobiles
- Electricity from Renewable Sources of 20%

A Consensus Forming

- December 1995 Intergovernmental Panel on Climate Change:

"the balance of evidence … suggests a discernible human influence in global climate."

- Statement of the American Geophysical Union (Jan. 1999)

"AGU believes that the present level of scientific uncertainty does not justify inaction in the mitigation of human-induced climate change…"

Scientific Consensus (cont)

- Satellites and balloon born instruments which measure the high atmosphere did not seem to agree with the increases in surface data which showed a marked increase in temperature.

- **Despite differences in temperature data, strong evidence exists to show that the warming of the Earth's surface is "undoubtedly real," and that surface temperatures in the past two decades have risen at a rate substantially greater than average for the past 100 years, says a new report by the National Research Council of the National Academies.**
  (National Research Council, January 12, 2000)

IPCC Again—1/22/01

- Global Warming Report Released
  By JOE McDONALD
  Associated Press Writer

  SHANGHAI, China (AP) -- In the most emphatic warning yet about the danger of global warming, a meeting of scientists from 99 nations issued a report Monday that sharply increased projected climate change blamed on air pollution and warned of drought and other disasters.

  The report, meant to spur stalled world talks on curbing greenhouse gas emissions, said global temperatures could rise by up to 10.5 degrees over the next century.

  "This adds impetus for governments of the world to find ways to live up to their commitments ... to reduce emissions of greenhouse gases," said Robert T. Watson, chairman of the U.N.-affiliated Intergovernmental Panel on Climate Change, which organized the Shanghai meeting.

National Academies Press, Climate Change Science: 2001 July

- “The mid-range model estimate of human induced global warming by the Intergovernmental Panel on Climate Change (IPCC) is based on the premise that the growth rate of climate forcing agents such as carbon dioxide will accelerate. The predicted warming of 3 C (5.4 F) by the end of the 21st century is consistent with the assumptions about how clouds and atmospheric relative humidity will react to global warming.” (Page 1)

NAS 2001 (Cont.)

- “The committee generally agrees with the assessment of human-caused climate change presented in the IPCC Working Group I (WGI) scientific report, but seeks here to articulate more clearly the level of confidence that can be ascribed to those assessments and the caveats that need to be attached to them.” (Page 1)

Science becomes Policy

- **washingtonpost.com**
- **Bush Withholds Backing Of EPA Report on Warming**
- By a Washington Post Staff Writer
  Wednesday, June 5, 2002; Page A02
- President Bush appeared to distance himself yesterday from a report by his administration that says human activities are mostly to blame for recent trends in global warming, which many scientists predict will seriously disrupt the environment.
- The report, prepared by the Environmental Protection Agency and submitted last week to the United Nations, for the first time put the administration on record as saying that the burning of coal, oil and other fossil fuels is the main cause of heat-trapping greenhouse gases.
- Until now, Bush administration officials have insisted there was too much uncertainty in climate change research to accurately assess blame.
- The White House opposes the Kyoto protocol, an international treaty that would impose mandatory reductions in carbon dioxide and other greenhouse gas emissions. While the EPA report spotlighted the impact of burning fossil fuels, it suggested nothing beyond the administration's proposals for voluntary actions by industries and others to address the problem.
- Asked about the EPA report, Bush replied dismissively, "I read the report put out by the bureaucracy." He said he continues to oppose the international treaty and mandatory controls.


UNITED
NATIONS
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Bicycling for Transportation and Fitness

- Bicycle Facilities
- Bikes in Cities
- Bikes in the country
- Excellent Signage


HANGHAI
HANGHAI


BISTRO
BISTRO BUFFET 149
P&H


26.1


STOP
STOP
RICHTER


ACTION TEAM

Recommendations

- Goal to Transform the Missouri Economy
  - Technological advantages in renewables
  - Stop exporting energy dollars
- Policy to Reach this Goal
  - Build a market through a 10%-15% RPS
  - Incentives for distributed (small) generation
  - Incentives for biomass (cogeneration)
  - State purchase or produce program

Conclusion

- Missouri can have
  - Secure sources of home-grown energy
  - Sustainable & Renewable & Environmentally-friendly energy
  - Economic value of home-produced power
  - www.greenbike.org or www.iowapolicyproject.org